

REDUCTION OF NOISE IN IMAGE SENSORS

ABSTRACT OF THE DISCLOSURE

An integrated image sensor having a conditioned top silicon oxide layer and/or one or more additional insulating layers/structures to reduce optical and/or electrical noise. The image sensor has an array of one or more pixels, each pixel having a photoelement formed on a substrate and configured to generate an electrical signal in response to incident light, and associated circuitry formed on the substrate and configured to process the electrical signal generated in the photoelement. In one embodiment, a portion of a top insulating layer in the integrated image sensor corresponding to each photoelement has a thickness different from the thickness of a portion of the top insulating layer corresponding to its associated circuitry to inhibit the flow of light between the associated circuitry and the photoelement and/or between the pixel and an adjacent pixel in the array. In another embodiment, the image sensor has one or more insulating structures formed on the substrate and configured to inhibit the flow of electricity between a photoelement and its associated circuitry and/or the pixel and an adjacent pixel in the array. The present invention can reduce optical and/or electrical noise and crosstalk to improve image quality and diminish artifacts in the image sensor's output.